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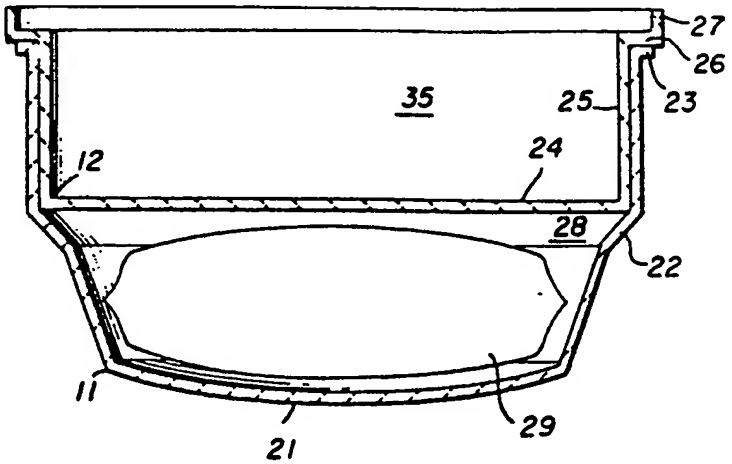
(54) **Combination microwaveable package and serving container.**

(57) A combination package and serving container for condensed foods is disclosed which comprises a container (11) and a cover (12) therefor of rigid, impact-resistant material substantially transparent to microwave energy and a pouch of oxygen barrier material (29) to contain the condensed foods and to be packaged within the container.

F I G. 1



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COMBINATION MICROWAVEABLE PACKAGE AND SERVING CONTAINER

BACKGROUND OF THE INVENTION

This invention relates to a combination package and serving container, especially adapted for foods such as condensed soups, which package is capable of being used to cook the packaged foods in a microwave oven.

Soup is packaged condensed to reduce shipping size and weight. A disadvantage of such packaging is that the consumer must transfer the condensed soup to a large container to reconstitute and heat it and then transfer it to a bowl before serving. It is therefore an object of this invention to provide a packaging system for condensed foods such as soup which can serve the multiple functions of package, cooking utensil and serving utensil.

Another object of this invention is to provide a package in which the packaged food may be heated in a microwave oven.

Still another object of this invention is to provide a disposable pakage which can provide a long shelf-life for the packaged foods with minimal use of expensive barrier materials.

SUMMARY OF THE INVENTION

These and other objects are met by the instant invention which is particularly pointed out in the appended claims and is described in its preferred embodiments in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a vertical section view through the combined package and serving container illustrating the same in closed condition and the packaged food in condensed form in a pouch.

Figure 2 is a vertical section view through the bottom portion only of the combined package and serving container illustrating the same with a lining of barrier film and the packaged food in condensed form.

Figure 3 is a vertical section view through the combined package and serving container illustrating the packaged food in reconstituted form and illustrating the cover removed from the body and associated therewith to provide a cover for cooking and transporting the reconstitued food therein.

DESCRIPTION OF THE INVENTION

Referring to the drawings by characters of reference, 11 designates generally the body of the container and 12 designates the cover. As illustrated, the body 11 includes a bottom wall 21 and upstanding marginal wall 22 which can be perpendicular to bottom wall 21 of which can taper downwardly toward bottom wall 21 or a combination thereof. Marginal wall 22 is provided with an outwardly directed peripheral flange 23 at its upper end.

The cover 12 consists of a bottom wall 24 of a size and shape to fit within the marginal wall 22 of the body 11 a substantial distance below the peripheral flange 23. Said cover 12 is formed with a marginal wall 25 corresponding to the taper of the upper open end of marginal wall 22 of the body 11 to frictionally fit within said upper open end of the body 11.

An outwardly directed peripheral flange 26 is provided at the upper end of the marginal wall 25 of the cover and said peripheral flange 26 extends outwardly beyond the peripheral flange 23 of the body 11 and is formed with an upstanding marginal rim 27.

Container body 11 is formed of a rigid, impact-resistant material which is substantially transparent to microwave energy and which can retain structural integrity at temperatures which will be attained during cooking of the food, e.g., up to about 107 deg C. Examples of such materials are talc filled polystyrene, plasticizied paperboard, polyethylene, polypropylene and polycarbonate. The container body 11 may be thermoformed or injection molded. The cover 12 may be made from the same material as container body 11 but may also be made of a thinner, less substantial, less temperature resistant material than the container. In the preferred embodiment envisioned by the inventor, body 11 would be a thermoformed from a pigmented polypropylene sheet or a filled polyethylene sheet, and the final wall thickness would be about 20 to 25 mils/(50.8 to 63.5.10^{-3} cm). Cover 12 would also be thermoformed from pigmented polypropylene or filled polyethylene sheet, and the final wall thickness would be about 15 mils. (38.1.10^{-3} cm)

The cavity 28 in body 11 formed by bottom wall 21 and marginal wall 22 of body 11 and by bottom wall 24 of cover 12 is dimensioned to receive a portion of condensed food. After the food is inserted into cavity 28, the cover 12 is applied by frictionally fitting the lower portion thereof into the open body 11 so that the outer periphery of

marginal wall 25 of cover 12 is located within the upper portion of marginal wall 22 of body 11, thereby disposing the flange 26 of cover 12 in contact with flange 23 of body 11.

An important aspect of this invention is the provision of a container which is capable of storing condensed foods for long periods of time. To provide this long "shelf life", it is necessary to include in the container some kind of material which provides a barrier to oxygen. In lightweight, disposable containers, typical such barrier materials are ethylene vinyl alcohol copolymers and polyvinylidene chloride; however, these materials are expensive and their use can therefore defeat the purpose of a one-use, disposable container. One advantage of the instant invention is that it provides a container capable of providing long shelf life for the packaged food but also minimizes the use of expensive barrier materials. Thus, in one embodiment as illustrated in Figure 1, the condensed food is packaged in a pouch 29 made of a material which can provide oxygen barrier sufficient to provide an acceptable shelf life (e.g., about six months to two years) for the packaged food (e.g., an oxygen barrier of about 0.05 to 0.1 cc/100 in^2(6.45 cm^2)-/atm/day). Such barrier materials are well known in the art and include aluminum foil, metallized polyethylene terephthalate, and resins such as ethylene vinyl alcohol copolymers, polyvinylidene chloride, amorphous nylon and blends thereof. These barrier materials, in thicknesses of about 1 to 2 mils (2.54 to 5.08.10^{-3} cm), are typically laminated to or coextruded with materials such as polyethylene, polypropylene, polycarbonate, or polyethylene terephthalate to provide bulk, mechanical strength and moisture protection. The pouch 29 is preferably shaped to closesly fit cavity 28. As an example, pouch 29 could be a tube of the width and length necessary to provide the desired serving size which could be coiled into the cavity 28 for shipment. In the preferred embodiment, pouch 29 would be formed on a horizontal thermoforming machine from a five-layered sheet of polypropylene/adhesive/ethylene vinyl alcohol copolymer/adhesive/polypropylene. Another advantage to this embodiment, in addition to the minimal use of barrier materials, is fact that the pouch material is separated from the container during retort, so the container material does not have to withstand the high retort temperatures (e.g., 121 to 132 deg. C for 45 minutes) that the pouch material must withstand.

In an alternate embodiment, as illustrated in Figure 2,the use of expensive barrier materials is minimized by laminating a film of barrier material 30 to the inside portion of body 11. Suitable barrier materials are the same as those described above for use in preparing pouch 29. The barrier material 30 covers bottom wall 21 and extends up marginal wall 22 to above the point 31 defined by the juncture of bottom wall 24 of cover 12 and marginal wall 22 of body 11 when said cover 12 is fully disposed within body 11. After body 11 is filled with the condensed food 33, it is sealed aseptically with a lidding material 32 before application of cover 12. Suitable lidding materials 32 include the barrier materials previously described with an additional heat seal layer, e.g., linear low density polyethylene or an alpha-olefin acid copolymer, suitably adhered to one side to facilitate reliable sealing of the lidding material 32 to the body 11. The lidding material 32 need not be transparent to microwave energy as it will be removed prior to cooking of the condensed food; however, it should provide a barrier to oxygen substantially equivalent to that of the barrier materials described above. Use of barrier materials is minimized in this embodiment by using only the amount necessary for protecting the food in its condensed, packaged form.

In use of both embodiments, it will be apparent that the downwardly offset portion of cover 12 confines the condensed food in the cavity 28 of body 11 defined by bottom wall 21, marginal wall 22 and bottom wall 24, thereby preventing the contents from having too free a movement. The downwardly offset portion of the cover 12 also permits nesting of packages as it defines a space 35 within which the body 11 of another combination packaging and serving container may be nested to provide for easy stacking of the containers. This nesting allows for economical shipping and packing of the containers; shipping case densities are near optimal because in the stacked state the pouch of one container is very near the pouch of the next container, separated only by the thickness of the materials in body 11 and cover 12. Alternatively, the downwardly offset portion of the cover 12 defines a space 35 within which other items, such as comestibles such as crackers or sandwiches, may be packaged. Finally, it is obvious that the downward offsetting of the cover 12 affords, when the cover 12 is removed, a space within the container sufficient for the addition of water or other liquid necessary to reconstitute the packaged food.

In practice, the combination packaging and serving container of this invention would be used by the consumer as follows. After removal of cover 12, the condensed food in body 11 would be reconstituted by addition of water or other desired liquid. This would, or course, require removal of the condensed food from pouch 29 in the embodiment illustrated in Figure 1 and, in the embodiment illustrated in Figure 2, would require the removal of lidding material 32. Cover 12 would then be inverted and placed over body 11, as illustrated in Figure 3, so that flange 23 of body 11 and flange

26 and marginal rim 27 of cover 12 are engaged. The entire container may then be placed in a microwave oven to heat the reconstituted food. Cover 12 when used in this manner serves to prevent splashing of the food contents during microwave cooking and later transport.

Claims

1. In a combination packaging and serving container for condensed food products which are prepared by adding a liquid thereto and heating, (a) a rigid, impact-resistant container body substantially transparent to microwave energy having a bottom wall and an upstanding marginal wall, (b) a rigid, impact-resistant cover therefor which is substantially transparent to microwave energy and which has a bottom wall and an upstanding marginal wall of a size and shape to (i) snugly fit within the upper portion of the container body to serve as a cover therefor and which is of such a depth as to confine food products packaged in said container body against undue freedom of movement while affording when removed a space within the body for accommodation of liquid added to the packaged food products, and (ii) snugly fit, when inverted, over the container body to serve as a cover therefore, and (c) a pouch of oxygen barrier material containing said condensed food product which pouch is contained in the space defined by the bottom wall and upstanding marginal walls of said container body and the bottom wall of said cover when said cover is snugly fit within the upper portion of the container body.

2. In a combination packaging and serving container for condensed food products which are prepared by adding a liquid thereto and heating, (a) a rigid, impact-resistant container body substantially transparent to microwave energy having a bottom wall and an upstanding marginal wall, (b) rigid, impact-resistant cover therefor which is substantially transparent to microwave energy and which has a bottom wall and an upstanding marginal wall being of a size and shape to (i) snugly fit within the upper portion of the container body to serve as a cover therefor and which is of such a depth as to confine food products packaged in said container body against undue freedom of movement while affording when removed a space within the body for accomodation of liquid added to the packaged food products, and (ii) snugly fit, when inverted, over the container body to serve as a cover therefor, and (c) aseptic, oxygen barrier sealing means for confining the packaged food products within the container body, the inside of said container body being lined with a film of oxygen barrier material to cover the inside bottom wall of said container and the portion of the marginal wall of said container below the point defined by the juncture of the bottom wall of the cover and the marginal wall of the container body when the cover is snugly fit within the upper portion of the container body.

3. The combination packaging and serving container of Claim 1 where the container body and cover are formed from polypropylene or polyethylene.

4. The combination packaging and serving container of Claim 2 where the container body and cover are formed from polypropylene or polyethylene.

5. The combination packaging and serving container of Claim 1 where the pouch is formed from a multilayer sheet having two outer layers of polypropylene and an inner layer of ethylene vinyl alcohol copolymer.

6. The combination packaging and serving container of Claim 2 where the pouch is formed from a multilayer sheet having two outer layers of polypropylene and an inner layer of ethylene vinyl alcohol copolymer.

FIG. 1

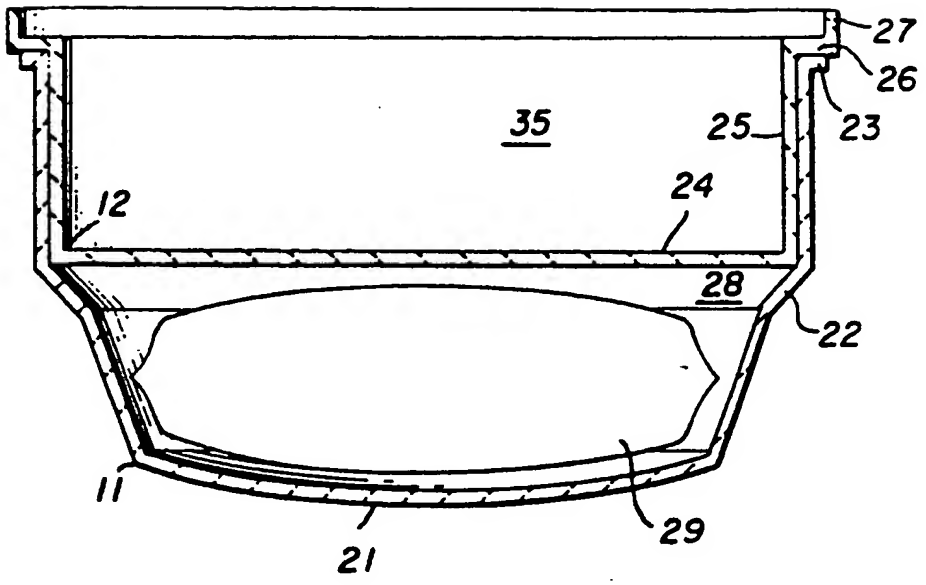

FIG. 3

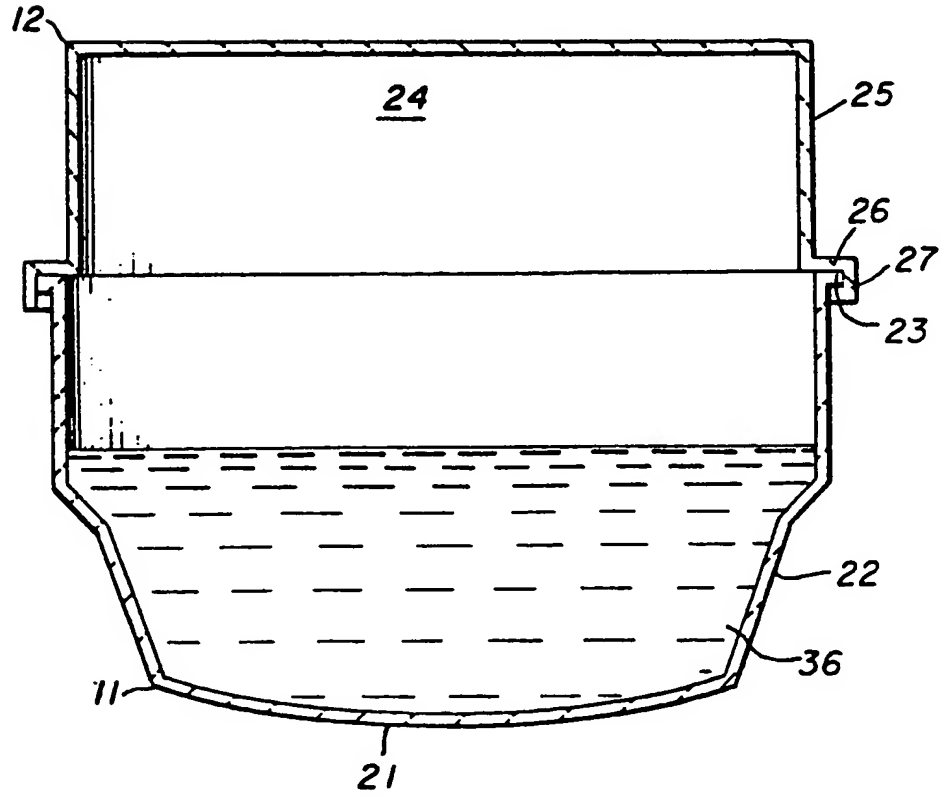

FIG. 2